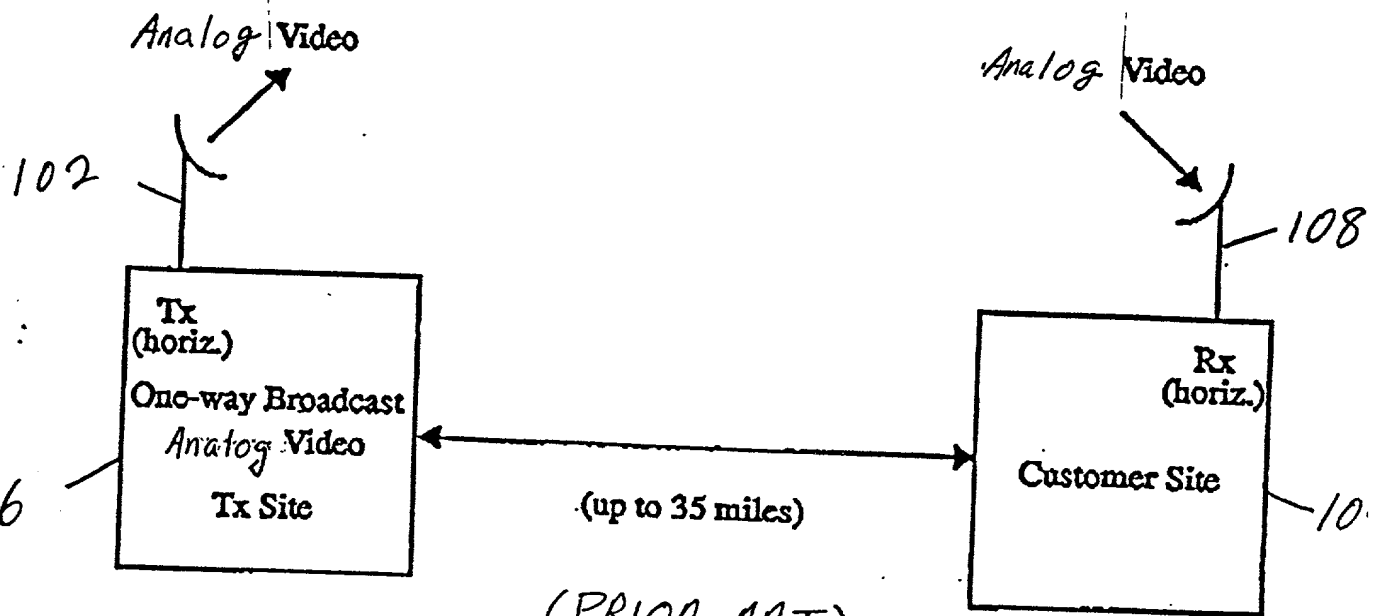


100



(PRIOR ART)
FIG. 1

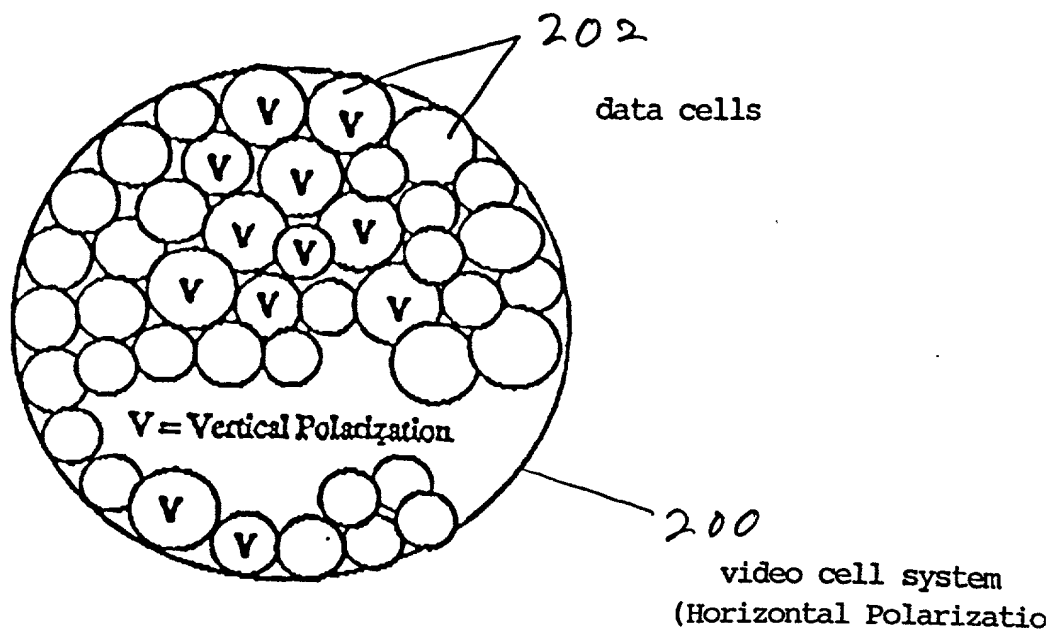


FIG. 2

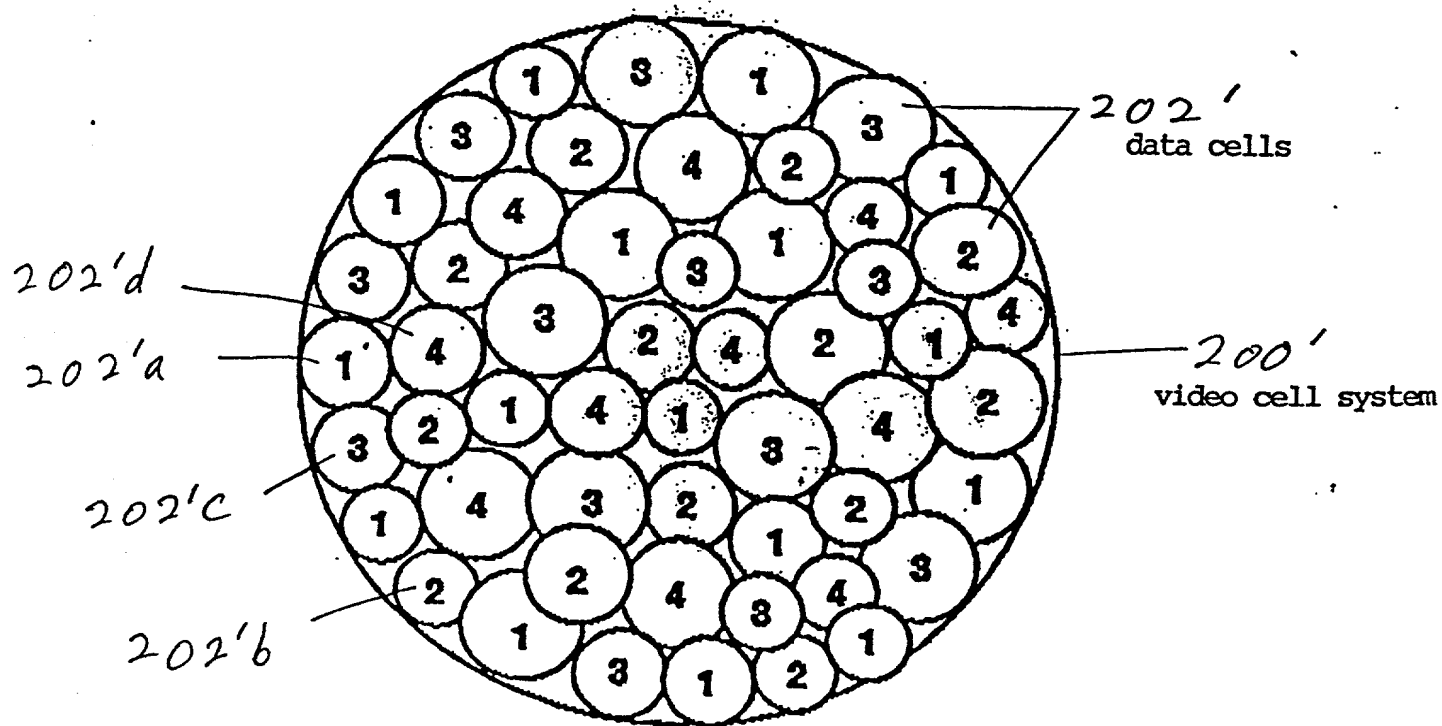


FIG. 3A

009945113004

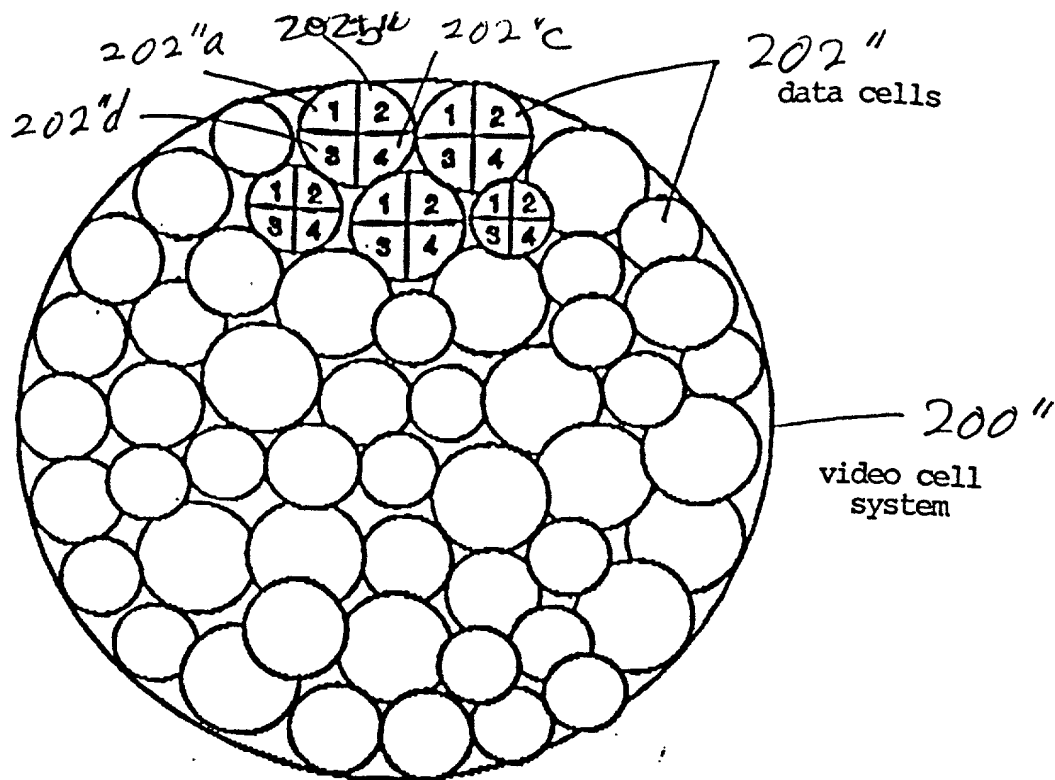


FIG. 3B

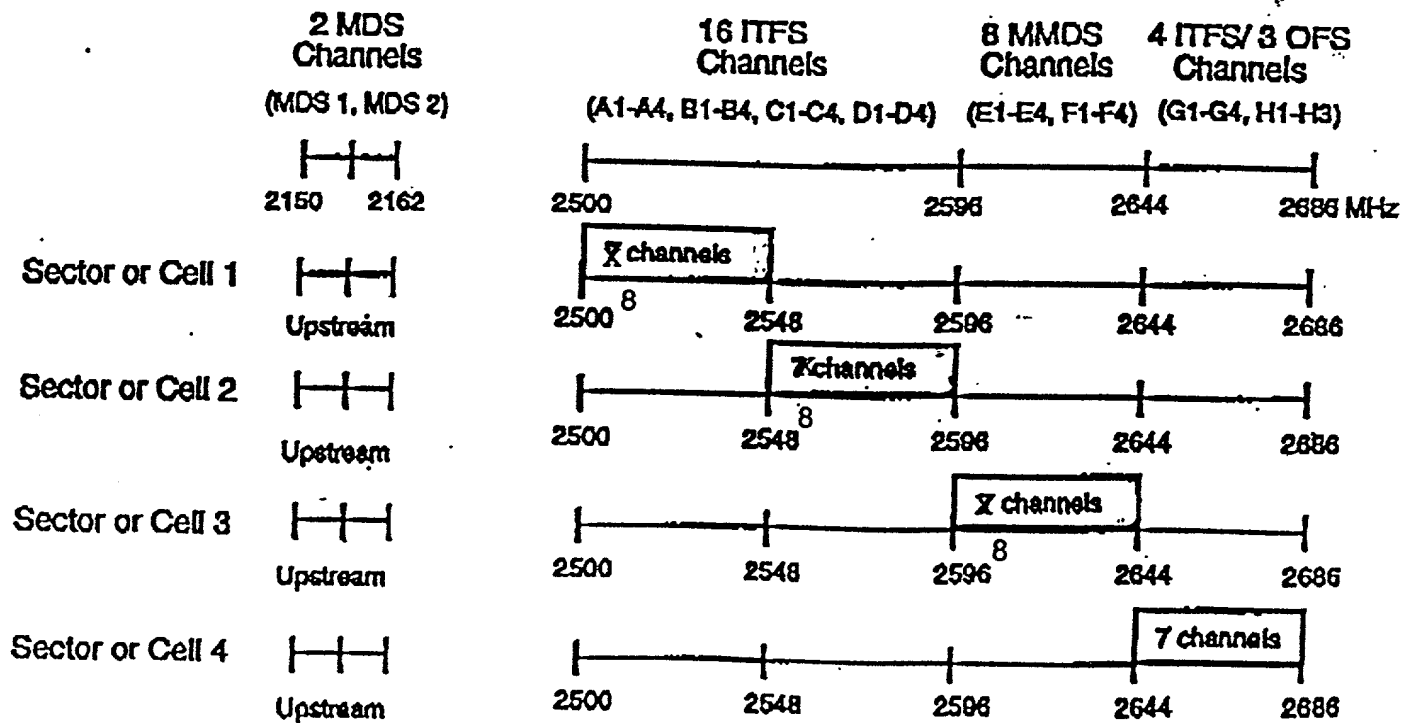


FIG. 4

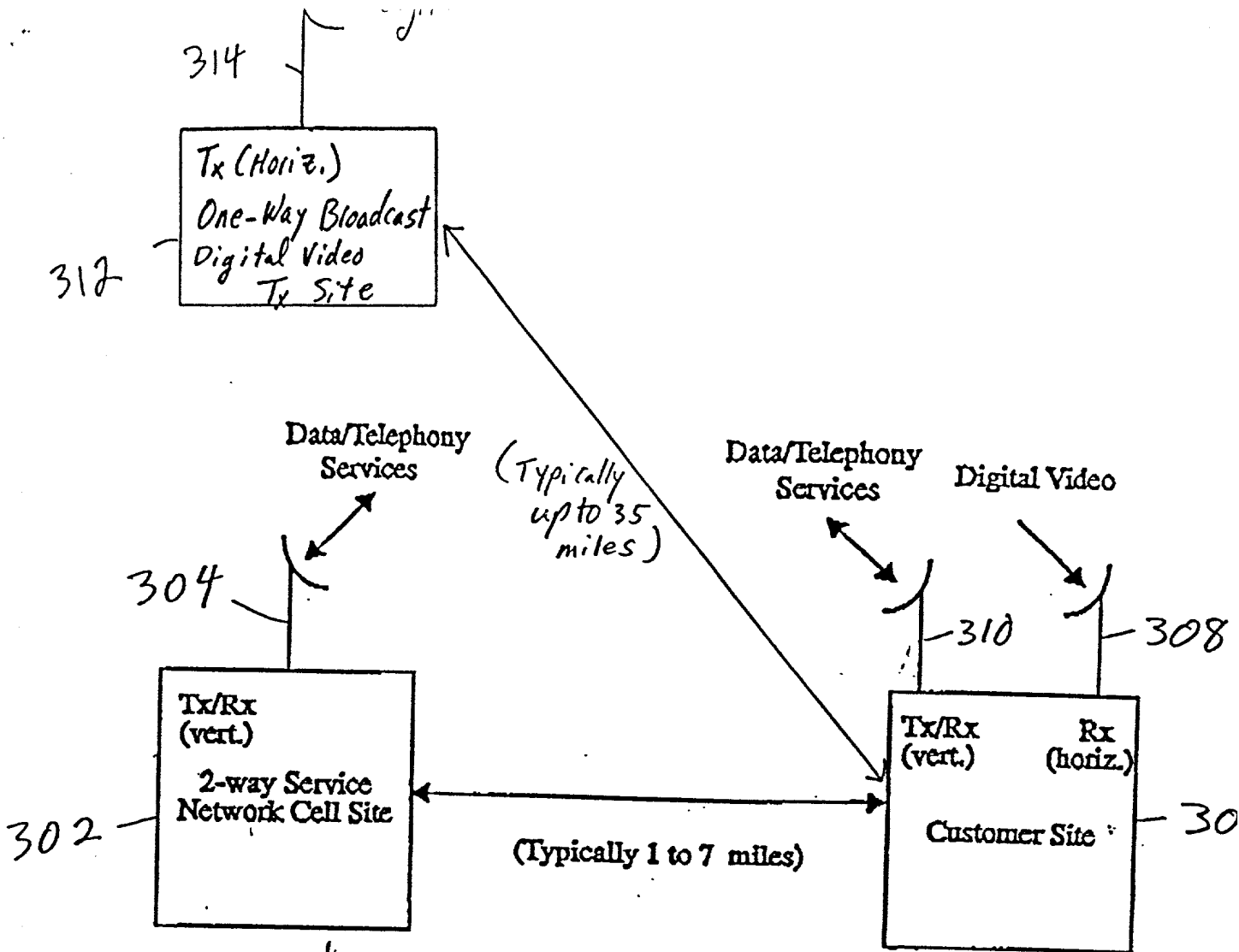


FIG. 5A

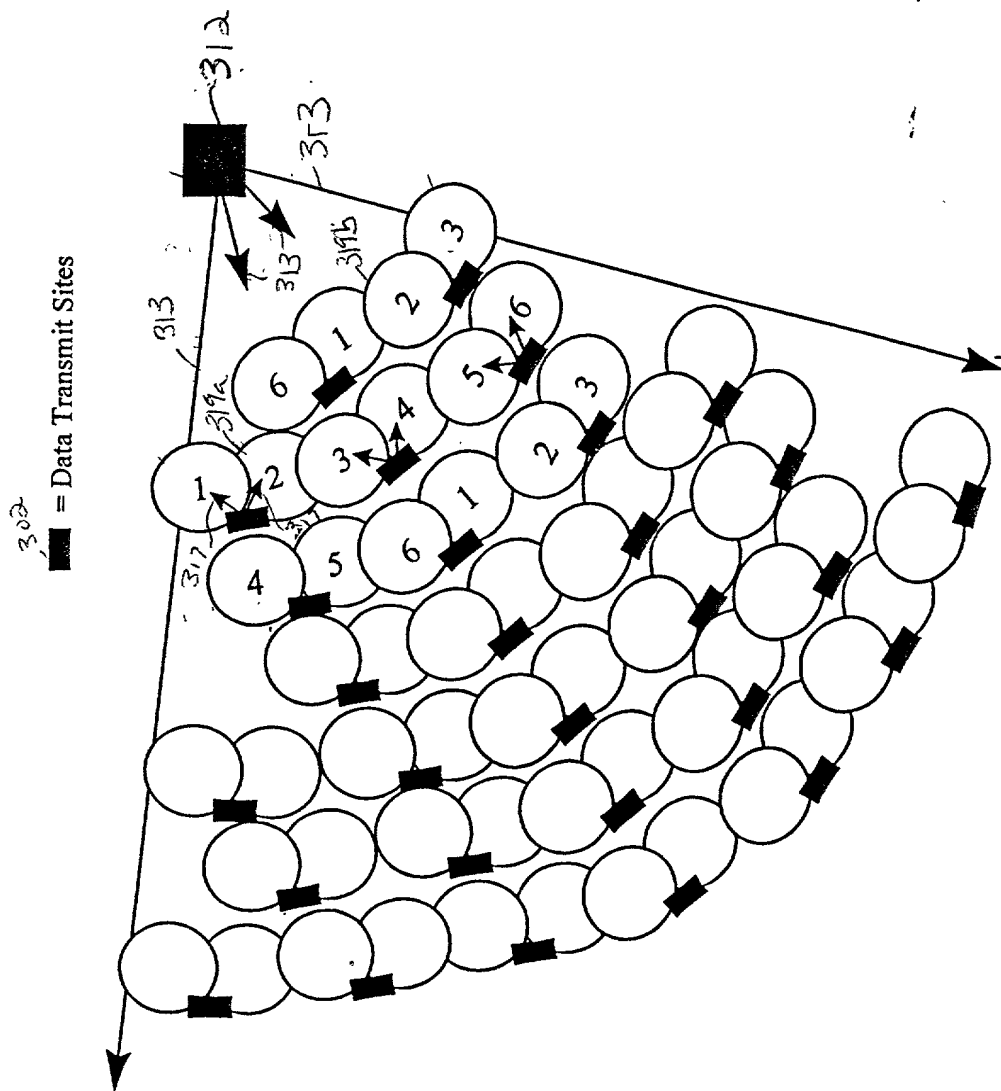


Figure 5b

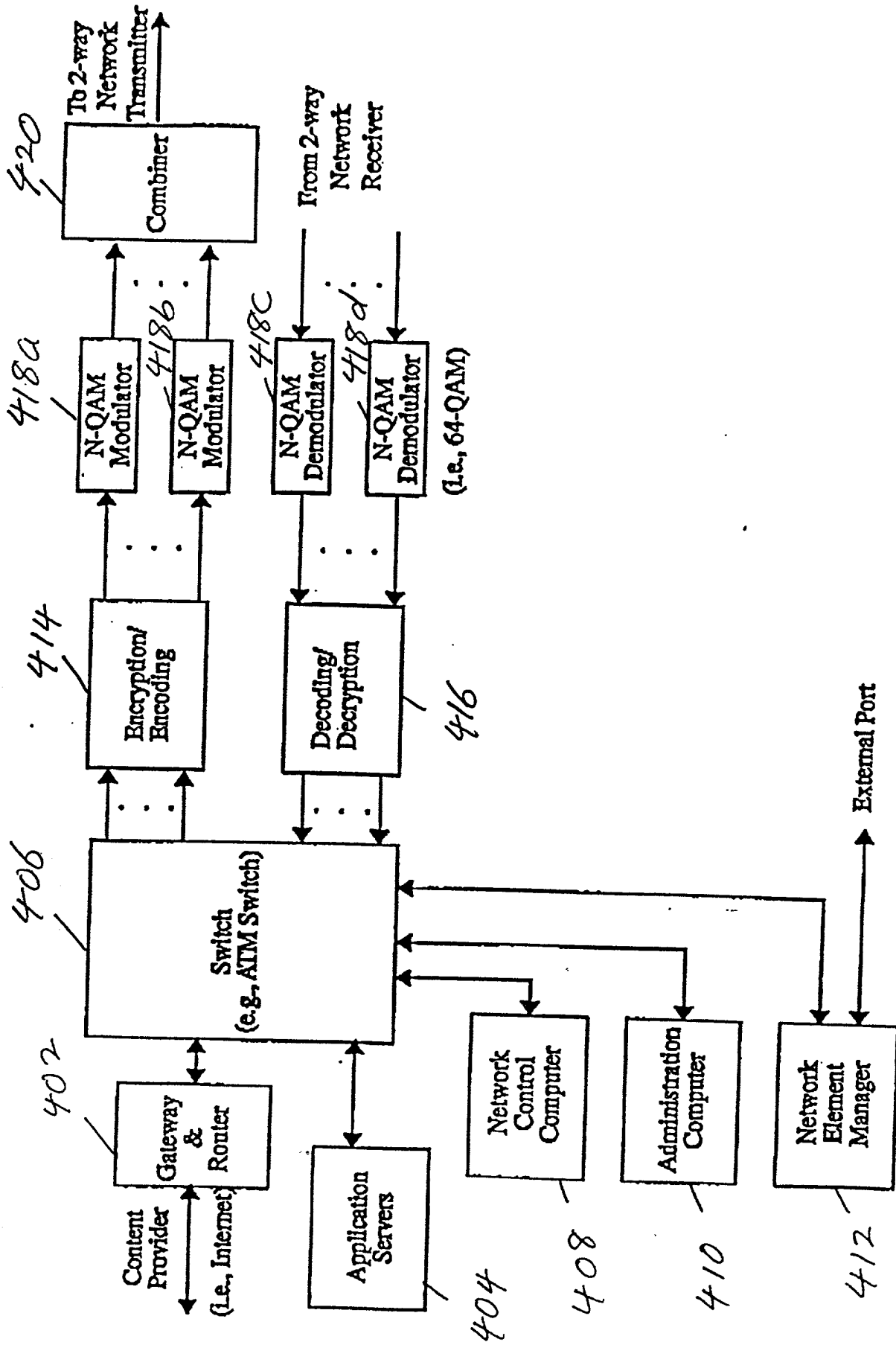


FIG. 6

From Customer Site Video Receive Antenna

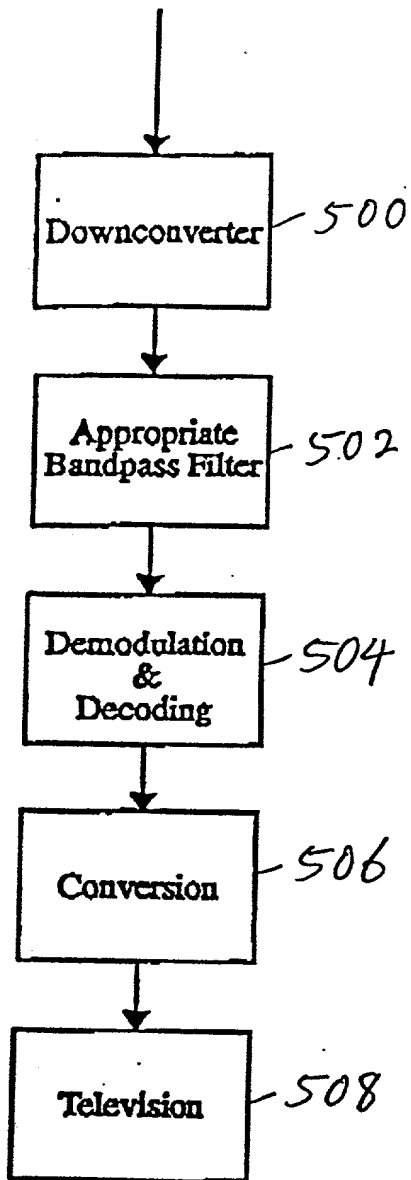


FIG. 7A

From Customer Site Data
Receive Antenna

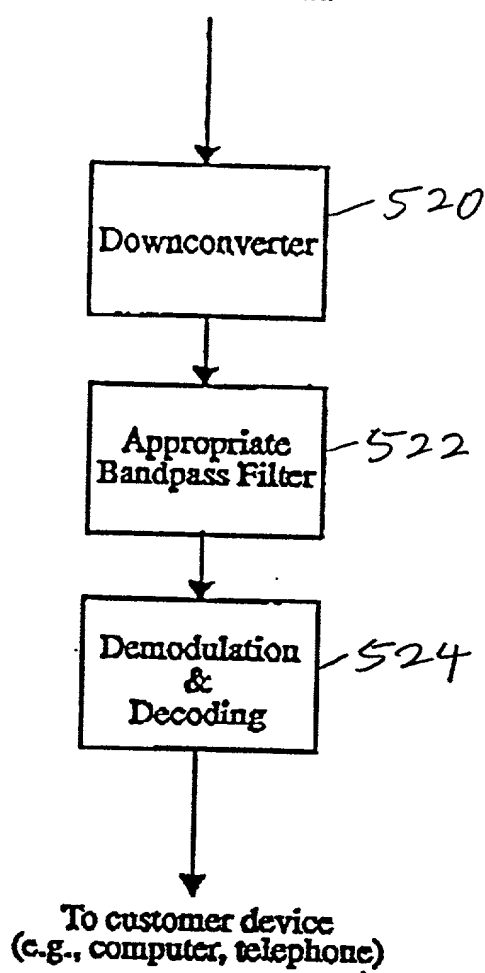


FIG. 7B

To Customer Site Data
Transmit Antenna

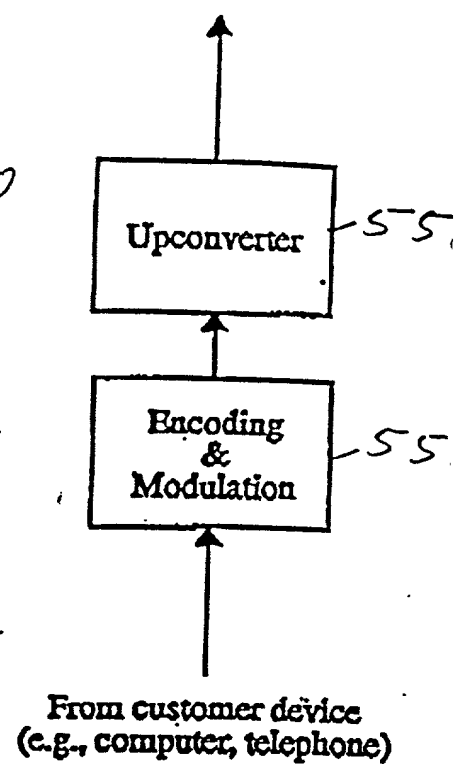


FIG. 7C

	Digital Video	2-way Service
Transmit Power (Average) per Channel:	47 dBm	27 dBm
Transmit Antenna gain	+ 16 dBi	+ 10 dBi
Waveguide Loss	- 4.0 dB	- 1.0 dB
EIRP/channel	59.0 dBm	36 dBm
Free space loss	- 134.70 dB (35 miles)	- 117.80 (5 miles)
Miscellaneous loss (RFI, Grazing, Aiming, Rain)	- 3.5 dB	- 1.0 dB
Signal Level Into Receive Antenna	- 79.2 dBm	- 82.8 dBm
Receive Antenna Gain	+ 21 dBi	+ 21 dBi
Signal Level Into Downconverter	- 58.2 dBm	- 61.2 dBm
Downconverter Gain	+ 20 dB	+ 20 dB
Signal Level out of Downconverter	- 38.2 dBm	- 41.2 dBm
Noise floor (6 MHz)	- 106 dBm	- 106 dBm
Downconverter Gain	20 dB	20 dB
Downconverter Noise Figure (NF)	2.5 dB	2.5 dB
Noise level out of Downconverter	- 83.5 dBm	- 83.5 dBm
NF Contribution from modem/settop and cable loss	0.4 dB	0.4 dB
Cable loss	- 3 dB	- 3 dB
Noise Level Into Modem/Settop Receiver	- 86.9 dBm	- 86.9 dBm
Signal Level Into Modem/Settop Receiver	- 41.2 dBm	- 44.2 dBm
S/N Ratio into Modem/Settop Receiver	45.7 dB	42.7 dB
S/N Threshold of Demod w/RS FEC (64 QAM)	24.5 dB	24.5 dB
Available Margin	21.2 dB (@ 35 miles)	18.2 dB (@ 5 miles)
*Required Fade Margin (F) for 99.9% avail.	18.6 dB	NA
Extra Margin for 99.9% @ 35 miles	3.3 dB	18.2 dB

* Based on the Bullington model : $F = -10 \log ((1 - \text{Avail}) / (2.5 * a * b * f * D^3 * 10^{-6}))$;
 $a = 1$, $b = 0.25$, $f = (\text{GHz})$, $D = (\text{miles})$

FIG. 8